Age dependent increase in the levels of osteopontin inhibits skeletal muscle regeneration.

Journal: Aging (Albany NY)

Publication Year: 2012

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PubMed link: 22915705

Funding Grants: Identification of hESC-mediated molecular mechanism that positively regulates the regenerative capacity of post-natal tissues, Interdisciplinary Training in Stem Cell Biology, Engineering and Medicine

Public Summary:
Skeletal muscle regeneration following injury is accompanied by rapid infiltration of macrophages, which play a positive role in muscle repair. Increased chronic inflammation inhibits the regeneration of dystrophic muscle, but the properties of inflammatory cells are not well understood in the context of normal muscle aging. This work uncovers pronounced age-specific changes in the expression of osteopontin (OPN) in CD11b+ macrophages present in the injured old muscle as well as in the blood serum of old injured mice and in the basement membrane surrounding old injured muscle fibers. Furthermore, young CD11b+ macrophages enhance regenerative capacity of old muscle stem cells even when old myofibers and old sera are present; and neutralization of OPN similarly rejuvenates the myogenic responses of old satellite cells in vitro and notably, in vivo. This study highlights potential mechanisms by which age related inflammatory responses become counter-productive for muscle regeneration and suggests new strategies for enhancing muscle repair in the old.

Scientific Abstract:
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